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**Advances in treatment and management: immunologic and cell-based regenerative therapies.**

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**Authors:** Martin Friedlander

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**Funding Grants:** Autologous Retinal Pigmented Epithelial Cells Derived from Induced Pluripotent Stem Cells for the Treatment of Atrophic Age Related Macular Degeneration

**Public Summary:**

The glaucomas are a group of eye diseases characterized by progressive ganglion cell and optic nerve damage leading to constriction of the visual fields and eventual loss of central vision. While typically associated with increased intraocular pressure (IOP), there are patients with "low or normal tension" glaucoma and there are patients with elevated intraocular pressures who do not experience optic nerve damage. The ocular pathology observed in glaucoma can occur in the trabecular meshwork (the main outflow tract for intraocular fluid), the ganglion cell layer of the retina and the optic nerve head and associated lamina cribosa. Therapy for these diseases has largely been directed at lowering intraocular pressure through pharmacologically decreasing aqueous humor production in the ciliary body or increasing outflow by targeting the trabecular meshwork with drugs or surgical intervention. While these approaches can lead to significant lowering of intraocular pressure, most patients still experience progressive visual loss, albeit at a slower rate than if untreated. More recently, efforts have been directed at providing neuroprotection for the cells primarily responsible for vision loss, the retinal ganglion cells. Recent advances in stem cell biology, regenerative medicine and cell-based therapies provide the opportunity to protect or replace cells damaged by increased intraocular pressure or other, less understood, abnormalities associated with glaucoma. In this chapter I have reviewed recent advances in the areas of stem cell biology and cell-based delivery of neuroprotectants for the treatment of retinal diseases and discuss their potential applications for the treatment of glaucoma.

**Scientific Abstract:**

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